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SCIENCE NEWS LETTER

PHOTO BY ERIC

MAY 6, 1944

TECHNOLOGY DEPT.

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MAY 6, 1944



Toothsome Tidbit

See Page 297

A SCIENCE SERVICE PUBLICATION

KEEPING UP WITH
Electricity

BROADCASTING TIN. "Flowing" tin plate by induction heating is now accepted practice in the industry. Frequency used in the first installation was 200,000 cycles per second—and the equipment was salvaged from a discarded broadcasting unit! Incidentally, this first installation is still in daily use.

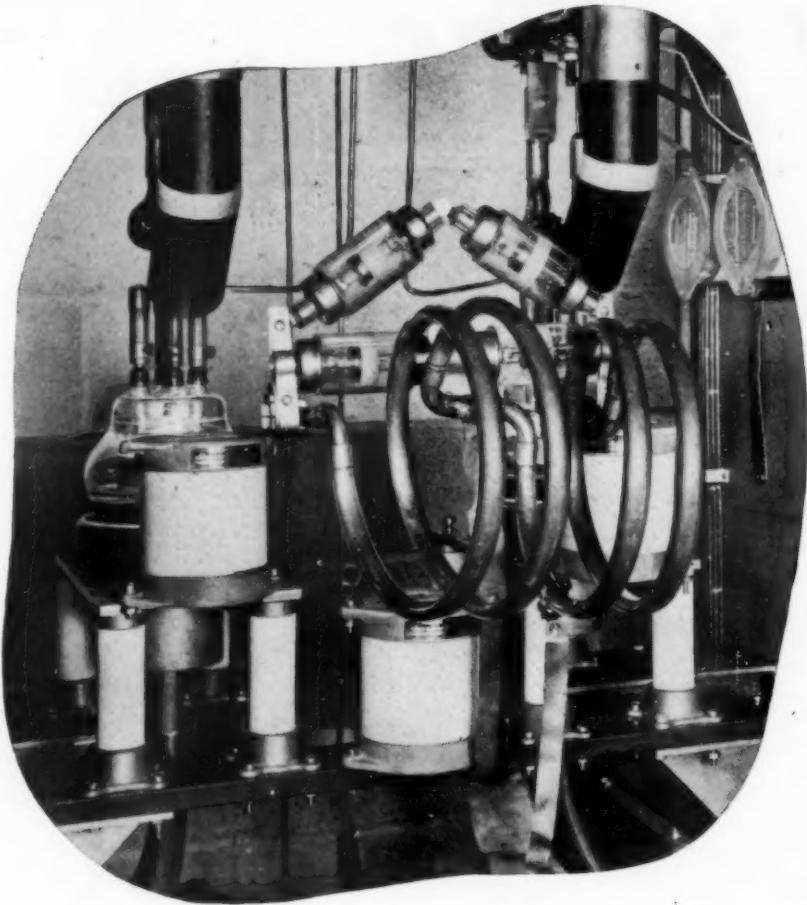
IT'S A MATTER OF SPEED. Radium gives out 1,200,000 times as much energy as the same weight of coal burned with oxygen. Even if we had plenty, however, it would probably be a poor substitute for coal, since it releases energy only one-eightieth as rapidly. Nothing that scientists have been able to do has had the slightest effect in speeding up the process.

THE SUN IS STILL SLOWER, releasing energy by a process which involves the transmutation of elements and takes between six and seven million years.

WOMAN'S WEAPON. One reason that electric irons aren't being made is that the thermostats used to control their temperature are busy on land, sea and air. They're guarding against motor trouble in tanks, fire danger in planes, overheating in gun equipment on battleships.

PEAK FLATTENERS. Resistance welders have speeded up production in thousands of war plants, but they have imposed enormous on and off single-phase loads on power circuits, often building up impossible peak demands. Capacitors are proving to be the answer, correcting the power factor to approximate unity.

THE HIGHER, THE FEWER no longer applies in radio vibrators. At high altitudes, vibrator contacts literally "boiled away" in ten hours, hence this type of radio was seldom used in airplanes. New-type vibrator, using Westinghouse-developed materials and techniques, has a life expectancy equal to that of the plane.



Plastics, plywood and electronics

This is a Westinghouse laboratory set-up for research in dielectric heating—internal heating by high-frequency radio waves. Together with induction heating—surface heating of metals by high-frequency radio waves—this process is daily finding new applications in industry.

One outstanding use of the principle of high-frequency heating is the Westinghouse development of flowing of tin on steel strip. Other important applications are in the bonding of plywood and the curing of plastics.

Dielectric and induction heating effect important savings in time and materials with attendant benefits of better control and more uniform results.

High-frequency heating is an example of electronics at work, another phase of Westinghouse leadership in electricity. Westinghouse Electric & Manufacturing Co., Pittsburgh 30, Pa.

WESTINGHOUSE PRESENTS: *John Charles Thomas, Sunday, 2:30 p.m., E.W.T., NBC. "Top of the Evening," Mon. Wed. Fri. 10:15 p.m., E.W.T., Blue Network.*

Westinghouse
PLANTS IN 25 CITIES OFFICES EVERYWHERE

CHEMISTRY

New Anti-Bacterial

Chlorellin, substance akin to penicillin in its action, discovered in a lowly green water plant. Still far from mass production and practical medical use.

► THE PENICILLIN family of germ-discouraging compounds secreted by the lowlier representatives of the plant kingdom has a new member named chlorellin, which is unique in that it is the first of the group to be found in a green plant able to manufacture its own food out of natural raw materials. All previously discovered compounds, including penicillin, are made by molds, soil bacteria, and other plants that have to be supplied with ready-made foods in the form of glucose solutions or the like.

This point promises to be of extremely great significance if it is found practicable to use chlorellin for medical purposes. All the producing plants need is water, a few assorted mineral salts, and a supply of carbon dioxide bubbled through the tanks in which they grow.

Announcement of chlorellin's advent is made in *Science* (April 28), by a group of twelve scientists who have been at work on the problem for a year and a half.

The producing organism is a very common one-celled fresh-water alga known as *Chlorella*; whence the compound's name. The investigating scientists used cultures of two species of this lowly plant, *Chlorella vulgaris* and *Chlorella pyrenoidosa*. After growing masses of the cells in five-gallon tanks, they filtered off the plants and treated the water chemically to extract whatever compound might have been left in it. In its crude-extract condition, chlorellin

is a brown stuff, sometimes tacky and gummy, sometimes hard and brittle.

Tried out in solution on test cultures of several kinds of bacteria, chlorellin produced effects very much like those of penicillin, checking the growth of such organisms as *streptococcus* and *staphylococcus*. The researchers even suggest that chlorellin may actually kill the germs, whereas the utmost that has ever been claimed for penicillin and related compounds is that they are bacteriostatic; that is, that they check growth and weaken the germs, making it possible for other agencies (usually the white blood corpuscles) to finish them off.

The investigators make it plain that chlorellin is still far from the point of large-scale production and practical use in medicine. The extracts thus far obtained are crude, and the concentration in the plants' growth water is thin and uneven. A great deal of additional research is still needed, they emphasize.

The communication in *Science* is signed by Robertson Pratt, T. C. Daniels, John J. Eiler, J. B. Gunnison, W. D. Kumler, John F. Oneto and Louis A. Strait, all of the University of California's college of pharmacy, and by H. A. Spoehr, G. J. Hardin, H. W. Milner, J. H. C. Smith and H. H. Strain, of the Carnegie Institution of Washington's division of plant biology, with laboratories at Stanford University.

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SPARK BARRAGE—This welder is using an oxy-acetylene torch to work on one of the big steam lines for Westinghouse roving Power Trains, which will be used to restore electric service in cities reconquered from the Axis by United Nations armies. Each eight-car train is capable of generating 5,000 kilowatts.

animals the systolic blood pressure fell the first day after injection of the vitamin from about 170 to 140 and continued to go down under the vitamin treatment to a low of 120. The figures are the average for nine experiments. The animals were given a vitamin injection daily. When the vitamin was stopped, blood pressures immediately rose, the average figure reaching a high of 180.

Rather large doses of vitamin K had to be given the rats to achieve these effects, the scientists report, pointing out that in any trial of the vitamin treatment on humans much larger doses may have to be given than those used for treatment of vitamin K deficiency. The next step will be to determine how much vitamin K must be given to reduce blood pressure in humans and whether that amount can safely be given.

The idea of using vitamin K as a high blood pressure remedy came from work reported by several other groups of scientists. It all hinges on the fact that vitamin K is the kind of chemical compound known as a quinone. This work showed that the high blood pressure resulting from inadequate blood supply to the kidneys might be due to a defect in breaking down amino acids.

This leads to an accumulation of substances called pressure amines which do

MEDICINE

For High Blood Pressure

Vitamin K will be tried as possible remedy for humans. Proves effective, in rather large doses, in experiments on rats.

► VITAMIN K, the anti-bleeding vitamin, will be tried as a possible remedy for high blood pressure, it appears from a report by Dr. Henry Schwarz and Dr. William M. Ziegler, of the Philadelphia Institute for Medical Research,

Philadelphia General Hospital, to the Society for Experimental Biology and Medicine.

The trials follow success in use of the vitamin to reduce experimentally induced high blood pressure in rats. In these

not accumulate under normal conditions when the tissues are supplied with oxygen via the blood stream. Normally such amines are rapidly destroyed by an enzyme, amino oxidase. They may also be inactivated by certain quinones which previous experiments suggested may have blood-pressure reducing qualities in rats with high pressures. The blood pressure lowering material found in the body and liver oils of fish is also believed to be a quinone.

With this background, the Philadelphia scientists decided to try another quinone, vitamin K, in rats with high

blood pressure resulting from insufficient blood supply to the kidneys.

Vitamin K is widely distributed in nature, among its richest sources being green leaves of different kinds, such as spinach and cabbage among food plants. A number of synthetic chemicals with vitamin K activity have been prepared and are available commercially. The anti-bleeding action of the vitamin is due to its part in the formation of prothrombin, first in a chain of substances essential for the clotting of blood when it is shed.

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DENTISTRY

Chill Jaw To Kill Pain

Refrigeration may take the place of currently used drugs as a local pain-killer in dentistry. Proves effective in 15 out of 22 cases tried.

► **REFRIGERATION** of the jaw may replace currently used drugs as a local pain-killer in dentistry, it appears from trials reported by Lt. Comdr. J. S. Restarski, of the U. S. Naval Medical Research Center, Bethesda, Md. (*Journal, American Dental Association*, May)

Sixteen sailors and WAVES volunteered for the experiments, in which 22 cavities were filled under local refrigeration at the near-freezing temperature of one or two degrees Centigrade. Preliminary studies with animals had demonstrated that no damage to tissues of the jaw occurred as a result of such chilling. In 15 instances, complete anesthesia or loss of sensation was obtained, while in seven a mild degree of pain was experienced.

To prevent pain caused by abrupt temperature changes, a means of gradually lowering the temperature was devised. Room-temperature refrigerant, placed in the circuit between the refrigerating unit and the metal gum applicators, was replaced by degrees with cold refrigerant as a centrifugal pump circulated the solution.

Only those cases in which pain on drilling recurred after refrigeration was discontinued were included in the study, in order to be sure the pain would have been present if the area had not been chilled.

"These preliminary findings are very encouraging," Dr. Restarski declares, "but trials on a large number of patients of all ages are needed to determine the effectiveness, limitations and

practicability of this type of local anesthesia in dentistry."

The suggestion for using refrigeration as a local anesthesia in dental work came from George Chaydeane, an air-conditioning engineer. He and Comdr. A. P. Black, of the Navy Medical Corps, conducted the initial studies in 1937 and Comdr. Black suggested the further investigation reported.

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AERONAUTICS

2-Cycle Engine Suggested For Private Airplanes

► **NO AIRPLANE** engine suitable for the post-war private market is now available, declared J. H. Geisse of the U. S. Civil Aeronautics Administration at the National Light Aircraft meeting of the Institute of Aeronautical Sciences in Detroit. It is necessary that either engine design be so simplified that engines can be produced cheaply in relatively small quantities or they must be produced in quantities exceeding any probable demand for personal airplane use, he said.

Research work is needed in the development of a suitable power plant and, he emphasized, it should certainly include work on two-cycle engines because of their simplicity. It would be a boon to private flying, he added, if such research developed an engine that would have increased power without greater fuel consumption.

Mr. Geisse does not believe that the development of the private airplane and its power plant will follow the pattern of gradual refinement of present designs. Nor does he feel that all the new developments will come from well-equipped and staffed laboratories.

"I expect," Mr. Geisse said, "that in the future as in the past much of the real development of the personal plane will be brought about by individuals with unorthodox ideas who have the stamina to stick to their ideas through hell and high water until they have proved that they were right."

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FROM ENGLAND—Dr. Edgar Douglas Adrian (left), British Nobelist in physiology and fellow of Trinity College, Cambridge, is greeted by Dr. Frank B. Jewett (center), president of the National Academy of Sciences, and Dr. Vannevar Bush (right), director of the Office of Scientific Research and Development, after delivering at the U. S. National Museum in Washington the second Pilgrim Trust Lecture before the National Academy of Sciences.

Photograph by Fremont Davis, Science Service staff photographer.

PHYSIOLOGY

Brain Pictures

Electrical impulses from living human tissue will enable scientists of the future to probe human thought, British Nobelist predicts.

► ELECTRICAL impulses from the living human brain will be able to give scientists of the future a method of telling what a person is thinking about whether he wants to tell them or not, Dr. Edgar Douglas Adrian, British Nobelist in physiology and fellow of Trinity College, Cambridge, predicted in delivering the second Pilgrim Trust Lecture before the National Academy of Sciences in Washington.

The electrical pictures of practical thought will be possible only after "the young men come back from war and start doing research again," Dr. Adrian explained.

Not at all a matter of thought transference or any such thing, the brain physiological research of the post-war era has already had its path blazed for it by research that began as early as

that which the British physiologist Sir Charles Sherrington reported in American lectures in 1905.

Even now, by tapping the electrical impulses in the brain, it is known that the nerve cells work simultaneously with the flickering of light seen by the eyes. The observer can tell how the brain pictures are developing because the electrical charges are widespread and not confined to any one area such as that which would be expected to be controlled by the eyes alone. By analyzing these general patterns of electrical brain waves it is even now possible to explore the vague borderlines of just what is happening in the brain.

Perhaps the brain research of the future, Dr. Adrian suggested, will give us a complete mechanical scheme of brain action, without recourse to some-

thing uncertain and indeterminate to explain what happens.

By applying radio amplifier methods to tune in on the electric impulses that are generated by brain activity, the so-called brain waves, Dr. Adrian was able to measure the current in single nerve fibers. He was the first scientist to do so and for this work shared the 1932 Nobel Prize in medicine and physiology with Sir Charles Sherrington.

Scientists can already tell "quite reasonably well" what sort of pictures are formed in the receiving area of the brain when we see things. How these pictures are analyzed or recognized is not known. At present there are only one or two ways of finding out about this in the conscious brain. One of these is the electro-encephalogram or brain wave record. The other makes use of the flickering light.

Dr. Adrian said this gives "an interesting suggestion of the borderland area between the region where the visual message is received and the rest of the brain, but I wouldn't like to say it tells exactly what goes on in that area."

It does tell that the messages from the eye apparently spread out over a pretty large area of the brain. This area can be mapped out to a large extent. It is much larger than the primary receiving area, so presumably the visual picture is analyzed by a pretty large brain area.

For mapping this area, the person whose brain mechanism is under study looks at a flickering light on a screen while records are made of his brain waves, that is of the electrical changes in his brain as he watches the light. The light flickers at a rate of from 10 to 20 flickers per second.

The electrical changes picked up by electrodes inserted in the back of the head have the same rhythm as the light flicker on the screen. By moving the electrodes to different parts of his head to pick up electrical activity from different parts of the brain, the scientists can tell by the change in rhythm from that of the light flicker which parts of the brain are working on the eye message of the flickering light.

Repeated noise does not produce such effects as measured by any of the methods used.

Some rather different physical method of probing brain activity will be needed in the future, Dr. Adrian said, but he feels it will be developed fairly soon when the old and new generations of scientists are working together again.

MEDICINE

Arthritis Pain Relieved

Muscle spasm and disability resulting from rheumatoid disease are lessened by a new treatment, which consists of injections of the drug, neostigmine.

► A NEW treatment of rheumatoid arthritis which swiftly relieves the painful muscle spasm and consequent disability is reported by Dr. Philip R. Trommer and Dr. Abraham Cohen, of the Philadelphia General and Jefferson Hospitals. (*Journal, American Medical Association*, April 29)

The treatment consists in hypodermic injections three or four times weekly of the drug, neostigmine, also known as prostigmine. Out of 19 patients with rheumatoid arthritis and similar related conditions, 13 gave a favorable response to the treatment.

One patient had been bedridden and unable to feed or care for herself for a year. She had a pronounced deformity of her knees and feet, a rigid spine and "claw hands." Her right knee was held bent at a 90 degree angle and the left one was bent to 110 degrees. The hamstring tendons were shortened on both legs. All previous treatment with salicylates and gold salts had failed to help.

Within 15 minutes after a test dose of the neostigmine, she was able to extend her right knee to 130 degrees and to cross it over the left. As the treatment was continued, she was able to open and close her hands, to get out of bed and into a wheel chair without help, to wash her hands and face and comb

her hair and could put her arms and hands in back of her head. In this patient's case the limit of improvement was reached after three months of treatment because of the partial abnormal union of the bones of the joints. Other patients showed similar improvement even when the disease had been present for years.

Although the neostigmine does not affect the diseased condition of the joints, it does relieve the accompanying muscle spasm which the Philadelphia doctors believe is one of the primary sources of the severe pain and deformities in rheumatoid arthritis. More attention should be given to this symptom of the disease, they say, advocating also wider experimental use of neostigmine.

The idea of using this drug came from a report by Dr. H. Kabat and Dr. M. D. Knapp, of the Mayo Clinic, of encouraging results with it in subacute and chronic infantile paralysis, another disease in which muscle spasm is said to play a prominent part.

Besides the hypodermic injections of the drug three or four times a week, some patients may require doses by mouth three times daily to give a more prolonged effect. Atropine is given to prevent undesirable side effects.

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CHEMISTRY

Two New Kinds of Rubber

Lactoprene, developed in a government laboratory, is made from sour milk acid. Other new synthetic product uses butadiene and secret chemical.

► TWO NEW KINDS of synthetic rubber, one developed in a government laboratory, the other by a private industry's chemists, were announced at the New York meeting of the American Chemical Society's rubber division.

Lactoprene is the name of the government chemists' compound, which was first produced at the Eastern Regional Research Laboratory of the U. S. Department of Agriculture near Philadel-

phia. Leaders in this research were C. H. Fisher, W. C. Mast, C. E. Rehberg and Lee T. Smith.

As its name implies, lactoprene is made from a milk product. The starting material is lactic acid, the stuff that makes sour milk sour. The molecules of lactic acid are polymerized, or chemically welded together, into bigger molecules of a compound known as methyl acrylate, which has long been

used as a raw material for plastics of various sorts. The methyl acrylate is converted into the new synthetic rubber, lactoprene.

Lactic acid can be obtained through the fermentation of other things besides milk. Almost any cheap, abundantly produced carbohydrate, like molasses or starch, can serve as raw material. An especially ready material, however, is the milk sugar in whey, a by-product—almost a waste product—of that part of the dairy industry that turns out cheese and industrial casein.

The other new synthetic rubber, which as yet has no special name, made its bow under the auspices of G. W. Dolan, president of the Mathieson Alkali Works. One of its ingredients is butadiene, important constituent of the GR-S rubber now being turned out in quantity. The other principal ingredient was not disclosed, but it was stated to be "a new chemical produced from readily available raw materials." Although still in the development stage and far from ready for mass production, its cost was estimated to be about the same as that for GR-S on the same scale of manufacture.

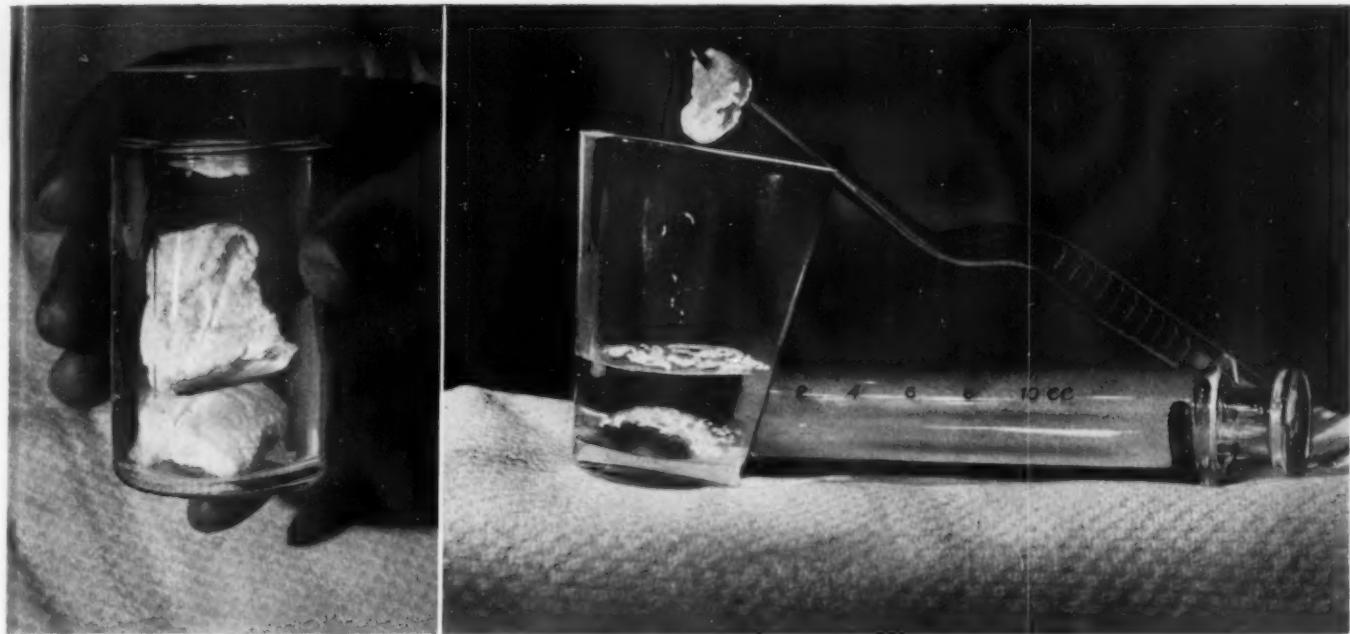
Chief merit of the Mathieson synthetic, Mr. Dolan declared, is its ability to stand up under hard use that makes rubber hot. An acknowledged weakness of GR-S tires is their tendency to heat when run fast, which of course means more rapid wearing out and more frequent blowouts. The new synthetic was also declared to be highly resistant to cuts and abrasion.

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Heating Eliminated

► EXCESSIVE heating in automobile tires made of synthetic Buna rubber will probably be eliminated by the addition of certain non-black pigments of very fine particle sizes which have developed into reinforcement pigments, declared Alan R. Lukens, of Thompson, Weinmann and Co., Cambridge, Mass., at the same meeting. These non-black pigments, he said, promote reinforcing without increasing the conductance of electricity. The new discovery promises to bring this synthetic into wider public use.

When the natural rubber was plentiful, he added, "we enjoyed rubber tires which gave us good mileage even at high driving speeds. The natural rubber made tires which gave these re-



RESEMBLING SEA-FOAM CANDY—The white material in the glass jar at left is made from blood—perhaps the blood you donated to help save the lives of our fighting men. From the fluid part of blood scientists are extracting not only albumin, used instead of plasma to relieve shock, but many other substances technically known as fractions. The fraction shown in the pictures taken at Walter Reed General Hospital in Washington, by Fremont Davis, Science Service Staff Photographer, is fibrinogen, necessary for normal clotting of blood. Fibrinogen is converted by thrombin, another blood constituent, into fibrin, the essential portion of the blood clot. The blood clot is nature's way of stopping bleeding. Fibrin foam on the forceps, right, is employed to help stop bleeding. These are the first pictures showing fibrinogen used in operations at an Army general hospital. Frequently the use of electro-cautery, which seals off the blood vessels the surgeon's knife has cut across as he opens the brain to find and remove a brain tumor, for example, is not entirely successful and fibrinogen comes to the rescue. A bit of the taffy-like stuff shown at left is dropped into water containing thrombin and with a forceps the surgeon lifts out the foam, which looks like a damp wad of cotton. The syringe is used in measuring the solutions of thrombin and saline. Put onto the bleeding spot in the patient's brain, this fibrin foam acts just like nature's blood clot and swiftly stops the flow of blood. The scientist primarily responsible for the development of fibrin foam is Dr. Edwin J. Cohn, in charge of the Office of Scientific Research and Development project at the Harvard Medical School's Laboratory of Physical Chemistry.

sults largely through the development and use of finer and finer sized carbon blacks. However, when these fine carbon blacks were used in Buna rubber, the increased fineness results in high tire temperatures."

Certain extender pigments will double the tensile strengths normally achieved with low proportions of the finer carbon blacks, he stated. "When smaller proportions of carbon blacks can be made to develop as much strength in this synthetic rubber as was obtained by the larger ratios now generally thought necessary, rubber articles can be made which have not only this necessary toughness but also a minimum of electrical conductance and internal heating when under continual use."

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PUBLIC HEALTH

Paralysis Foundation Spent More Than Million

► MORE than one million dollars, \$1,278,836.04 to be exact, was granted and appropriated by the National Foundation for Infantile Paralysis last year in fighting this much-dreaded disease.

Virus research, after-effects research, education, medical publications, and epidemics and public health were the five main categories under which the funds were allocated, according to the Foundation's annual report. General administrative expenses totalled \$84,970.53.

The money comes from funds contributed by the public during celebrations of President Roosevelt's birthday. Half the money remains with the local chap-

ters which provide care for infantile paralysis patients in their areas, the other half going to national headquarters for use in fighting the disease on a nationwide basis.

The Foundation's report reviews the support it has given the Kenny method of after-effects treatment and reveals that it has spent more than \$500,000 in testing and evaluating the method and training doctors, nurses and physical therapy technicians in its use.

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Black ilmenite, a common mineral in the earth's crust, by an elaborate chemical process yields pure white titanium oxide, a versatile substance used in skin protectives, welding rods, white paints, and paper.

PHYSIOLOGY

Dogs Kept Young Looking By Protecting Nerves

► THE WAY to keep an old dog healthy and young looking while his contemporaries grow gray and decrepit with age is to protect his nerves, it appears from studies reported by Prof. M. K. Petrova, 70-year-old former colleague of Ivan Pavlov, at the tenth physiological conference held in Moscow in memory of the great Russian physiologist.

Prof. Petrova has worked with the same dogs for 15 years, subjecting some to various nerve injuries and carefully guarding others from any sort of nerve injury. The dogs suffering from nervous injuries, she noted, have all grown decrepit while the healthy dogs still look comparatively young. The latter do not show the gray hairs, bald spots and affected teeth of the former who, in addition, also suffer from skin diseases and cancer-like tumors.

The conference was organized by the biology section of the Soviet Academy of Sciences and many of the reports were by former pupils of Pavlov, the Soviet Scientists' Anti-Fascist Committee states in an account of the meeting written especially for release by Science Service.

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MEDICINE

Penicillin May Be Remedy For Typhus Fever

► PENICILLIN may be an effective remedy for typhus fever, dreaded war and famine plague, and spotted fever. This possibility is seen by Dr. Donald Greiff and Dr. Henry Pinkerton, of St. Louis University, as a result of experiments they report. (*Proceedings of the Society for Experimental Biology and Medicine*.)

They injected typhus fever germs, technically known as *rickettsiae*, into the yolk sacs of developing hens' eggs. Penicillin was subsequently injected into 18 of the infected yolk sacs. Most of the untreated, control eggs died with heavy typhus infection between the ninth and thirteenth days after injection of the germs. Four of the penicillin-treated eggs died within six days, which was before the usual period for massive growth of the typhus germs. The deaths were believed due to injury from the injections.

A bit of the yolk sac membrane of each egg was smeared on a glass slide

and examined under the microscope for typhus germs. The estimated number of germs in such specimens from the untreated eggs ranged from a low of ten to 100 in three eggs to as many as 5,000 to 8,000 in seven eggs. In the treated eggs, however, the estimated numbers of germs ranged from less than one in nine eggs to 1,000 to 5,000 in one egg.

The growth of the typhus germs was strikingly checked by the penicillin but, the scientists state, in no instance did the germs completely disappear.

They are now trying the effect of penicillin on experimental typhus and spotted fever infection in mice and guinea pigs. The experiments with the eggs, they state, suggest the possibility "that penicillin might be effective in these diseases."

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HORTICULTURE

New Florida Navel Orange Receives Plant Patent

► A PLANT PATENT, numbered 625, has been issued on a new kind of navel orange tree, that appeared as a sport or variant in the grove of D. J. Nicholson of Orlando, Florida. As he describes it, the new fruit is of moderate size, definitely tart and tangy but with high sugar content, and a firm skin that does not release much of the stinging citrus oil that is characteristic of many familiar navel orange types.

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CHEMISTRY

Copper Is Now Used To Make Synthetic Rubber

► COPPER has found a place as a new and powerful agent in the production of Buna S synthetic rubber, declared Dr. A. A. Somerville of the R. T. Vanderbilt Co., New York, at the New York meeting of the American Chemical Society's rubber division. Copper has long been avoided by the natural rubber industry.

Two new vulcanizing accelerators for synthetic rubber, both chemical compounds of copper, are several times as powerful as the conventional type now in use, he stated. Why copper speeds vulcanization is still a mystery. A large number of chemical compounds of copper were tried by Dr. Somerville in his investigations and found to be effective. Sixteen other metals were tried and found to be without effect.

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GENERAL SCIENCE

Liberty Ship To Be Named For Dr. William E. Ritter

► A LIBERTY SHIP has been named for Dr. William E. Ritter, co-founder and honorary president of Science Service and one of America's leading biologists, the U. S. Maritime Commission has announced.

The launching of the S. S. "William E. Ritter" was the first week in May, and the ship that bears this name was built at the Permanente Metals Corporation Yard No. Two at Richmond, Calif., not far from the University of California with which Dr. Ritter was long connected.

Dr. Ritter's death on Jan. 10 closed a long and eventful career in science during which he brought into existence with the aid of the late E. W. Scripps the Scripps Institution at La Jolla and Science Service. Dr. Ritter was born in 1856 in Wisconsin. (See *SNL*, Jan. 22,

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ORDNANCE

Garand Patents Device To Test Muzzle Pressure

► JOHN C. GARAND of the Springfield Arsenal, designer of the M-1 rifle, has taken out another patent, rights in which are, as customary, assigned royalty-free to the government. The patent, No. 2,347,188, covers a simple but effective testing device for measuring the powder pressure in the rifle bore just back of the muzzle.

The test barrel has a small hole bored in it, into which a short piston is fitted. On the outer end of this rests a bar of accurately known weight, between two upright rods that act as guides. One of the rods is marked off in inches or centimeters, and has a light ring around it that serves as a pointer.

When the rifle is fired, the sudden pressure of the powder pressure behind the bullet kicks the little piston upward, and it in turn lifts the weight to a height that corresponds to the muzzle pressure. The device is useful in determining the performance of various types of cartridges.

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IN SCIENCE

NE FIELDS

ENGINEERING

Higgins Patents Lighters Carrying MT Boats

► BIG, FAST lighters for the unloading of cargo ships at some rendezvous far out at sea, and equipped with means for actively fighting submarines should they attack, are the newest contribution of the designers in the Andrew J. Higgins establishment in New Orleans. U. S. patent 2,347,412 has recently been issued on this invention.

Principal means for defense against sea-wolves is a pair of fast little motor craft carried in cradles on the afterdeck, which slopes toward the stern, forming a partial ramp. In case of need, the ramp would be completed by loosening the big boat's transom ("tailboard" or "endgate" in landlubber language), which is hinged so that the dropped upper edge can trail in the water. Down this would slide the waspish little fighting boats, to assail the assailant with depth charges, light cannon and machine guns.

Science News Letter, May 6, 1944

HORTICULTURE

Zoo Victory Gardens Help Feed the Animals

See Front Cover

► LEO, THE LION, and Jocko, the monkey, are going to have plenty to eat this year—at least if the zoos have anything to say about it. Food shortages and lack of manpower have created major headaches in American zoos, and many ingenious schemes have had to be developed to ameliorate the problem.

Few animals get rationed food and almost every zoo has a victory garden. They range in size from small plots for those with limited space to almost 150 acres where a productive zoo farm is a regular feature. Practically every vegetable known to North American agriculturists is raised in at least one of them.

A survey conducted by the American Association of Zoological Parks and Aquariums shows that last year most crops ran to corn, soybeans, tomatoes, cabbages and other staples; but peas, spinach, cucumbers and even watermelons were raised.

A head of cabbage is tempting enough to cause the 30-year-old hippopotamus at the Philadelphia Zoological Garden, shown in the picture on the cover of this SCIENCE NEWS LETTER, to open his mouth wide.

In the garden from which the animals of the San Diego Zoo will be fed, sunflowers, sweet potatoes and peanuts play a prominent part. Since corn is at a premium on the West Coast, the rest of the farm is being devoted to that crop.

Approximately 500 bushels of carrots and five tons of cabbage will be grown in the Detroit Zoo, repeating last year's success. Monkeys seem to be extremely fond of kale, so that green is included in the garden recently planted at the Portland Zoological Park in Oregon. Last year over 7,000 pounds of kale were harvested there by zoo gardeners.

Many zoos make special arrangements with farmers to secure culls, undersized and misshapen vegetables. Others persuade grocery stores to save unsold lettuce and cabbage, beets and carrot tops for their use.

Many of the parks save all their grass cuttings for the animals. Others secure browse by pruning forest trees. In some cities the department of parks cooperates by cutting and delivering hay from public parks and lands.

Providing substitutes for foods that have been absolutely unobtainable or where the price is exorbitant has been a real problem in many instances. The scarcity of bananas, for instance, necessitated the use of dehydrated bananas and boiled sweet potatoes. In other cases substitutions were well-nigh impossible.

Least troubled by difficulty over substitutes was the Philadelphia Zoo. Roger Conant, the curator, reports that they began experimenting with specialized animal diets back in 1935 and for many years have been using highly satisfactory, though unorthodox, foods for most members of the animal collection. Basic rations call for beet pulp, soybean meal, dry skim milk, oyster-shell flour and grain meals of many kinds.

Few of the zoos have used anything but horse meat for some years. But various factors, including the rather wide use of horse meat for human consumption, have tended to make this scarce in some areas.

Attendance at zoological parks which are located close to public transportation has been particularly good. The animals are doing their best to help the harried war worker and average citizen recuperate from war jitters.

Science News Letter, May 6, 1944

CHEMISTRY

Plastic Replaces Hair In Weather Instrument

► REMEMBER the cry that went up during the early days of the war for long blond hair—only naturally blond hair would do—to be used in instruments for obtaining vital information concerning the weather? It was not needed in large quantities, but long hair alone was believed capable of doing the work satisfactorily. Blondes will be relieved to know that the Weather Man is no longer eyeing their golden tresses with envy—science has devised a substitute.

A coated plastic, known as an electric hygrometer strip, is now being used to measure moisture changes in different layers of air with great accuracy. The strips are part of a radiosonde which, attached to a free balloon, soars into the stratosphere, continually radioing to an automatic recorder on the ground data such as wind velocity and icing conditions.

Edges of the five-inch strips are treated to provide electrical conducting surfaces. This substitute for human hair, long regarded as the most sensitive element obtainable for measuring variations in moisture, was developed by engineers of the Friez Instrument Division of Bendix Aviation Corporation and the Bureau of Standards under the sponsorship of the Navy.

Science News Letter, May 6, 1944

GENERAL SCIENCE

Wellesley Summer School To Teach Techniques

► A SUMMER school of techniques will be held for the first time on the Wellesley College campus during June, July and August. The general aim of the school will be to enable both men and women to increase their proficiency in the techniques used in special fields.

There will be classes in chemistry, biology, geology, physics and mathematics, utilizing the college science laboratories. The student will have an opportunity to learn some techniques in writing and to study labor relations. Courses will be offered in conversation and translation of foreign languages.

The needs and interests of present war workers, teachers, and those preparing for reconstruction work abroad have been kept in mind in planning the courses offered.

Science News Letter, May 6, 1944

ARCHITECTURE

Your Home When Peace Comes

Post-war, low cost prefabricated house will be a prototype of the conventional home, with modern improvements. Kitchens can be converted into recreation rooms.

By EDITH GOLDMAN

► AS THE MODERN streamlined automobile developed from the horse-drawn buggy with the aid of science, so the post-war home, prefabricated and pre-engineered, is expected to replace the old homestead. And just as the technique of mass production slashed the prices of automobiles down to a range which the average American could afford, so will it take the home of tomorrow out of the window-shopper's bracket and into reality for this wage group.

Because of its newness—scarcely out of the idea stage as far as large-scale production is concerned—the layman's concept of the prefabricated home is in many cases extremely distorted. When he thinks of prefabrication, he has a vision of endless rows of box-like homes making up a housing project, set up in the drab surroundings of defense plants.

Or the layman might associate prefabrication with some of the bizarre types of Sunday-supplement houses

which are pictured as suspended from masts or patterned after igloos. And, as far as the average American is concerned, either of these extremes in construction types has a distinctly negative appeal.

The bleak-looking defense housing projects, however, are as far from the post-war prefabricated home as the olive-drab jeeps and Army trucks are from the luxury automobiles of the future. And the revolutionary ultra-modern home of the future is still in the dream stage. The prefabricated home, engineered for super service, is actually a prototype of the conventional home—with modern improvements added.

Partial Prefabrication

For many decades partial prefabrication has been accepted as a traditional part of conventional construction in the form of prefitted doors, windows, prepared roofing and pre-cut lumber. And now, hand in hand with the development of new materials primarily intended for combat use, plans for prefabricat-

ed homes await the utilization of these new improvements and discoveries when peace-time construction will be the order of the day.

Molded plastic-impregnated plywoods and compressed impregnated papers that have been developed to give durability and resistance to the speedy boats and planes of our armed services today have also given the prefabrication industry the opportunity to produce entire wall panels of homes by means of assembly line technique.

Cumbersome and Bulky

Take the wall of the conventionally built home as an example. Cumbersome and bulky, it is made up of six layers—the inside plaster, lath, insulation between studs, diagonal sheathing to steady the frame, building paper to keep out the wind, and exterior boarding as the outside layer. Obviously, a wall of this type could not practicably be prefabricated.

With the development of large-sized sheet materials such as the resin-impregnated plywoods with two-way tensile strength, it became possible to reduce the six- to eight-inch multi-layered wall to a wall measuring only 1½ inches in thickness.

It became possible for the first time to consider the entire cross section of wall or floor as a single integrated structural unit. With the aid of science, the streamlined wall has become stronger and more durable than its bulky predecessor, and perfectly adapted to mass production techniques.

Giving improved service, these engineered homes will be less subject to cracking finishes and sticking doors, and are likely to be better insulated, less drafty, and decidedly easier to heat than houses constructed in the customary "home-made" unscientific manner.

Why They Will Cost Less

Why will these newly constructed homes featuring the most up-to-date modern conveniences cost so much less to the home owner? The answer may be had in simple economic theory. Mass production, creating greater demand and reducing the number of middlemen involved, automatically lowered the price of automobiles, radio sets and wearing apparel. Just so will reduction in the enormous number of middlemen in-



EARLY STAGE—Whole walls of a prefabricated house are shipped from the factory, ready to be set into place. These workmen are well on the way towards producing an attractive home from the pieces.

volved in selling small hardware, glass, paints, and all of the other 80,000 parts required for the construction of an ordinary frame house, slash the cost of the house prefabricated at one focal point.

A survey of the relative costs involved was recently completed by O. B. Allen, Comptroller of the United Construction Workers, an affiliate of the United Mine Workers of America. He points out that the materials and mechanical equipment in a \$5,000 house actually cost \$1,200 at the initial source. Approximately

\$2,500, or 50%, of the total cost of the house is consumed in the middleman transactions.

Breaking the figures down still further, Mr. Allen explains that \$4 worth of glass at the original wholesale source costs the home owner \$47; that \$28 worth of paint costs him \$241; trim worth \$195 costs \$980, and \$230 worth of lumber, \$1,095. All other items in the house are also subject to similar wasteful practices, he adds.

Chief drawback of prefabricated housing, in the (*Turn to next page*)



OFFICIAL U. S. NAVY PHOTOGRAPH

now wear "Plastic Overcoats"

Bausch & Lomb 7X, 50mm Binocular

 Denied the continued use of vulcanized rubber for binocular covering, the U. S. Navy sought a plastic material that would furnish the metal-clinging, watertight, sure-grip properties required in sea-duty binocular body covers.

Because the cooperative effort of engineers representing Bausch & Lomb, the plastics manufacturer and the Navy solved the difficult details posed by this problem, the new all-weather Vinylite coat on today's binoculars is as good as and, in some important respects, better than the former rubber coats. This plastic does

not deteriorate in sunlight and clings more firmly to the metal body.

This superior covering material will be on the *better* Bausch & Lomb Binocular that will be available after Victory, one more reason why Bausch & Lomb Binoculars will still be known as "the world's best—by any test."

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Produced in collaboration with
Dr Wilbur L. Beauchamp,
The University of Chicago

WHAT THE FILM DOES Explains the use of the vacuum tube in radio by animated drawings. The filament circuit, the plate circuit, the grid circuit, and the control of the plate current by varying charges on the grid are explained in detail. The film shows how the vacuum tube operates as an amplifier, as a detector, and as an oscillator in the transmission station.

How the Film May Be Used:
In General Science, Physics,
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and Aeronautics.

Elements of ELECTRICAL CIRCUITS

Produced in collaboration with
Dr Morris Meister,
High School of Science, Bronx, N. Y.

WHAT THE FILM DOES Reveals the nature of electric currents and circuits. Animated drawings and photographic demonstrations explain electron motions, conductors, insulators, and factors affecting resistance. Detail explanation of resistance and the ohm, rate of flow and the ampere, electromotive force and the volt lead to an understanding of their interrelationship as expressed in Ohm's Law.

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Do You Know?

Plywood paddles for canoes may replace the former solid ash types.

Badly adjusted or misaligned steering mechanisms do more to grind tires into shreds than any other *tire-wearing* factor.

Textile authorities predict *cotton* will be exported in the post-war era to the tune of 3 million square yards annually.

Electric generating plants in the United States have a capacity of about 65,000,000 horsepower, or nearly 49,000,000 kilowatts.

White horse-tail hair is used in Brazil in brushes; the cuts nearest the roots are put in tooth brushes, the rest in shaving and other brushes.

Production of the mineral *fluorspar* for use in metallurgy, acid manufacture and ceramics should total more than a half-million tons for 1944.

Strawberries, blackberries, raspberries, currants, plums, apples, peaches, apricots and some other common fruits contain oil of *wintergreen*.

The rare pancake *tortoise*, *Testudo Tornieri*, of East Africa has a thin flexible shell and can flatten itself to crawl into crevices to hide.

A new silver *babbitt metal* for machine bearings has been developed which has the same bondability and corrosion resistance as tin-based babbitt.

A new *cobalt* ore deposit discovered in Spain shows by recent analysis to be 5.9% cobalt; it is expected production may reach 200 tons a month.

Low-bush *blueberries*, common particularly in Maine, have fruit which is typically blue, but occasionally plants are found bearing white, pink, red or black "blueberries."

A product from *peanut oil* has been developed as a substitute for olive oil as a worsted lubricant in weaving, for lard oil or neat's-foot oil in the leather industry, and for almond oil or similar oils in the manufacture of cosmetics.



POST-WAR LIVING—Emphasis in the kitchen of the future will be placed on attractiveness and efficient planning so that there is a minimum of wasted energy.

From Page 299

eyes of many who agree to the obvious advantage of lowered cost and increased utility, is the possibility of monotony in design. In this new type of construction, however, although the walls and roofs will be mass-produced and standardized, the prefabricators are providing for a wide range of flexibility in the final set-up of the homes. Competition between pre-fabricators should serve to stimulate the continual creation of new designs for the homes.

Post-war kitchens in these prefabricated units are expected to be a boon to the housewife. The working area of the newly designed kitchens will be so arranged that the housewife will be able to do three-quarters of her work sitting down, rarely ever having to stoop or bend.

When not in use, stove, sink and other working units will be concealed beneath covers that will join to form an attractive buffet. Neat and compact, they will not look like kitchens at all between meals, and can be used as recreation rooms.

Some of the prefabricated units will be of ideal size for the newly married couples, providing room for expansion in the form of additional wings as the family increases.

Traditionally, the lower income bracket group had to be satisfied with cramped apartments or with housing hand-me-

downs—the more expensive structures in various stages of deterioration. With the aid of cost-slashing mass production of prefabricated units, this same group should be able to become owners of new prefabricated homes at locations of their own choosing and at prices they can afford to pay.

After the war, when manpower and material are available and our fighting men come back to live in these new homes, the evolution of prefabrication should progress, taking full advantage of the application of science for better living.

Science News Letter, May 6, 1944

METEOROLOGY

New Kind of Anemometer Uses Electric Eye Device

► A NEW KIND of anemometer, or wind-velocity-measuring instrument, is offered by R. H. Packard of Newton, Mass., for patent 2,346,864. Most anemometers make use of some kind of mechanical device for measuring their rate of rotation, but this involves work, and puts a drag, however small, on their operation. Mr. Packard's anemometer lets the vanes pass between a light source and a photocell or electric eye. This accurately records rate of rotation without putting any mechanical load whatsoever on the delicately balanced rotor.

Rights in the patent are assigned to General Motors Corporation.

Science News Letter, May 6, 1944



When 4800 horses put on the feed-bag — *somebody may go hungry*

► To send a thousand bombers over Germany for just *one* raid takes somewhere in the neighborhood of a million and a half gallons of high-octane gasoline.

That's one reason why we're short of gasoline on the home front. The "cream" of U. S. gasoline, the high-octane components, as well as the lion's share of our supply of anti-knock fluid, is going into fighting gasoline.

Remember, practically every gallon of America's aviation gasoline contains Ethyl antiknock fluid.

More and more Ethyl is going overseas today, but after the war much of the high-octane gasoline now needed for fighting will be available for automobiles, trucks, buses and farm tractors. Ultimately, automotive engines will be designed to take advantage of this better gasoline and you'll get more work, more power and more

economy out of every gallon.

We look forward to the time when our research facilities, now engaged in war work, will be free once more to work hand in hand with engineers of the automotive, aviation and petroleum industries in developing the better, more economical transportation of the post-war world.

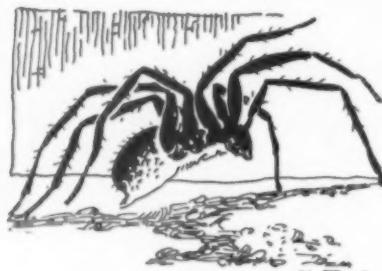
* * *

ETHYL CORPORATION

Manufacturer of Ethyl fluid, used by oil companies to improve the antiknock quality of aviation and motor gasoline

CHRYSLER BUILDING, NEW YORK CITY





Arachne, Ally of Ares

► POOR ARACHNE, victim of a raw deal on the part of envious Athena, has turned to the roughest of Olympian masculine company: she makes the dreadful contrivances of Haephestus more useful to Ares. To step out of the metaphor, spider-web threads are an important item in the terrible accuracy of present-day artillery.

If you get a chance to peep through the telescopic sight of a field piece or a naval gun, or into any one of the numerous optical aids to long-range destruction, such as a range or height finder, a battery commander's telescope, or one of those amazing instruments that automatically forecasts the position of an enemy bomber in the sky for the benefit of the anti-aircraft guns, you will invariably find the circular field of vision neatly divided into quadrants by two very fine lines that cross at exact right angles in the center of the circle. Cross hairs, ordnance men call them. Get the point of crossing right on the target, be sure your range, deflection, windage and other factors are correct, and you have a bulls-eye coming.

These cross hairs are hairs in name only. Actually, they are crossed spider-

web threads. Raising spiders for the purpose of supplying these optical landmarks is a regular industry in this country. It is only a small one, to be sure: probably not more than ten or a dozen persons are engaged in it even now. One spider can furnish a great deal of filament, and for any given instrument a couple of inches is all that is needed.

Most spiders can produce more than one kind of web filament. The thin, sticky threads that actually trap insects are not suitable for use in optical instruments; they are beaded at close intervals with drops of adhesive stuff that would be most distracting. But the thicker, smooth cable spun by a spider when she lets go and drops to escape from a dangerous or embarrassing situation is ideal, especially since it is usually spun in several distinct strands which can be split and used separately.

Certain species of spiders are preferred over others for this highly specialized kind of product, choice being largely on fineness and evenness of diameter. The group of round-bellied spiders that spin rather aimless, ramshackle webs seem, curiously enough, to be the best producers of this kind of filament. And notable among their number is our notorious, highly poisonous acquaintance, the Black Widow.

However, for quick repairs in the field, any kind of spider will serve. All you need to do is catch one, put her on a forked twig, and when she drops off, twirl the twig rapidly as she descends on her rapidly-spun cable. You will thus harvest enough filament to replace the cross hairs in a dozen gunsights.

Science News Letter, May 6, 1944

CHEMISTRY

Chemical Protects Wood Against Fungi and Rot

► DEFENSIVE warfare against a hidden enemy is contemplated in patent 2,347,635, obtained by Dr. Frank B. Smith of the Dow Chemical Company,

and assigned by him to his employing firm. It is on a process to discourage fungi and other rot organisms from attacking green lumber while under treatment to prevent cracking and splitting. Standard treatment of fresh lumber, Dr. Smith points out, is to get it well wetted down with a solution of some chemical that attracts water. Recently such organic compounds as sugar and urea have shown promise, but they have the handicap of offering extra food for the organisms of decay. To discourage these, he simply adds an adequate concentration of one of the chemicals of the chlorophenol group, which are quite effective fungicides.

Science News Letter, May 6, 1944

Bulgaria is reported to have shale deposits rich in petroleum in mountainous areas from which production is expected soon.

STEP UP YOUR EARNING POWER! know CHEMISTRY

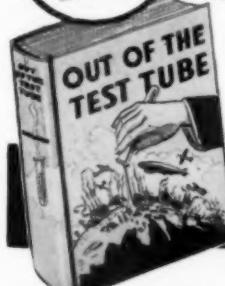
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—Warren Peter Everette—*Columbia Univ.* 79 p., \$1.85, Contributions to Education No. 901. This book is the result of a course in experimental science for secondary-school students.

ANIMAL FACES—R. Marlin Perkins—*Foster & Stewart*, 93 p., illus., \$1.50. A series of very clever animal photographs.

AS WE WIN—Post-War Planning Committee—*Dept. of Educ. and Research of C. I. O.*—31 p., illus., paper, 5c. Report No. 1. An important labor group looks at the war and post-war period with special reference to inflation and social security.

THE CANVASBACK ON A FRAIRIE MARSH—H. Albert Hochbaum—*Am. Wildlife Inst.*, 201 p., illus., \$3.

CHINA—Mai-Mai Sze—*Western Reserve Univ. Press*, 59 p., paper, 25c. Toward a Democratic Foreign Policy, Reference Pamphlet No. 2.

CONCERNING JUVENILE DELINQUENCY—Henry W. Thurston—*Columbia Univ. Press*, 236 p., \$2.75.

CONTRIBUTIONS FROM THE UNITED STATES NATIONAL HERBARIUM; Vol. 29, Part 1, Taxonomic Studies of Tropical American Plants—C. V. Morton—*Govt. Printing Off.*, 86 p., paper, 25c.

EMPIRE OF THE AIR; Juan Trippe and the Struggle for World Airways—Matthew Josephson—*Harcourt, Brace & Co.*, 236 p., illus., \$3.

THE HOME MEDICAL BOOK—Royal S. Copeland—*Vinston*, 612 p., illus., \$2.50, rev. ed.

INFRARED SPECTROSCOPY—R. Bowling

Barnes, Robert C. Gore, Urner Liddel and Van Zandt Williams—*Reinbold*, 236 p., illus., \$2.25. Industrial applications and a bibliography of infrared spectroscopy.

MILITARY APPLICATIONS OF MATHEMATICS—Paul P. Hanson—*McGraw-Hill*, 447 p., illus., \$3. The object of the book is to provide direct training in the practical mathematical work of the various branches of the armed services, with insight into the reason why each type of work is needed. The problems taken up include maps and map reading, field artillery, air navigation, practical military engineering, etc.

NEOPRENE (GR-M)—Dept. of Labor—*Govt. Printing Off.*, 45 p., illus., paper, 10c. Rubber Series No. 1. Safeguarding workers handling synthetic rubber in the rubber industry.

PLANS FOR BUILDING DRIVER TESTS—*American Automobile Assoc.*, 28 p., illus., paper, \$1. Detailed instructions useful to those administering driver tests especially in these days when apparatus is not always obtainable.

QUARTERLY OF THE COLORADO SCHOOL OF MINES; Vol. 39, No. 2, Review of Petroleum Geology in 1943—F. M. Van Tuyl—*Colo. Sch. of Mines*, 127 p., illus., paper, \$1.

VIRUS DISEASES IN MAN, ANIMAL AND PLANT—Gustav Seiffert—*Phil. Library*, 332 p., illus., \$5. A survey and reports covering major research work done during the last decade.

YOUR LIFE'S WORK—Samuel Spiegler—*Riverdale Press*, 450 p., \$2.50. Advice in-

tended particularly for Jewish young people written by the Research Director of the Jewish Occupational Council.

WHAT IS EDUCATION?—Edward Leen, C.S. Sp.—*Sheep & Ward*, 288 p., \$3. This book presents a Catholic viewpoint.

Science News Letter, May 6, 1944

NUTRITION

Eating of Glucose Partly Replaces Water

► MEN in the dire need of water that comes when adrift on a raft at sea can, surprisingly enough, meet part of their requirements through eating glucose, Prof. James L. Gamble of Harvard Medical School told the Philadelphia meeting of the American Philosophical Society.

"It turns out that a part of the water requirement found for fasting can be replaced by glucose, and all of the physiological benefits of glucose can be gained, at no cost to the water exchange," he stated.

Hydrogen and oxygen are present in glucose, as well as in other carbohydrates, in the same two-to-one proportion that represents water, but with the addition of half-a-dozen carbon atoms per molecule. The rearrangement by which the body is able to make use of these elements is physiologically complex, but the living mechanism of human cells can do it if the need is great enough.

Science News Letter, May 6, 1944

Resistance to Infection

and antibody production apparently are closely linked to quantitative and qualitative protein-adequacy of the diet.* Meat not only is a rich source of proteins, but its proteins, being of highest biologic value, are the RIGHT KIND for antibody production.

**"It is evident, therefore, that antibody production is but a phase of protein metabolism and that a protein deficiency, whether due to an inadequate protein intake, to protein loss, or to defective protein metabolism, must, in time, impair the maturation or preservation of the antibody mechanism. . . . This means, in turn, that food may play a decisive part in infectious processes in which antibody fabrication is desirable." Cannon, Paul R.: Protein Metabolism and Acquired Immunity, *J. Am. Dietet. A.* 20:77 (Feb.) 1944.



The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

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MAIN OFFICE, CHICAGO . . . MEMBERS THROUGHOUT THE UNITED STATES

•New Machines and Gadgets•

ASH TRAYS, which may be carried about in the pocket, clamp tightly when closed to prevent spilling the contents. A cover on this newly patented flat, rectangular container is hinged along one side, and when opened reveals a hook, pivotally attached, by which the tray may be suspended.

Science News Letter, May 6, 1944

KEY CASE, for carrying keys in the pocket, resembles an ordinary jack knife. Each key in this patented device is pivotally attached to a sliding shank which is pulled out of a slot in the end of the case.

Science News Letter, May 6, 1944

INEXPENSIVE tire tool to remove pneumatic tires from drop-center rims, recently patented, consists of two separate metal rods with flattened ends, one of which is bent into a hook. The flat piece is inserted first, then the hooked rod goes between it and the rim. The curve of the hook acts as a fulcrum to loosen the tire.

Science News Letter, May 6, 1944

LIQUID-FILLED wrist compasses for American soldiers, accurate and reliable, have been developed by the Army from a foreign-made liquid-filled compass not suitable for combat use. The needle of this compass, shown in the picture, remains on the magnetic north even when the wearer is jogging on horseback.

Science News Letter, May 6, 1944



INSULATING material made of buckwheat hulls, wrapped around dry ice, results in better temperature control for the refrigeration of highly perishable foods. Fish fillets protected by this new packaging method remain in perfect condition for four days without freezing or loss of flavor.

Science News Letter, May 6, 1944

VENTILATED masks, now worn by welders in some war industries, protect them from sickness due to welding fumes. Compressed air unit fitted inside the mask directs fresh air outward over the wearer's face.

Science News Letter, May 6, 1944

REFLECTORS rotating on bicycle wheels warn automobile drivers at night that bicycle riders are crossing ahead. A recently patented reflecting surface may quickly be attached by hand to the spokes.

Science News Letter, May 6, 1944

GLASS RING jewels, developed for use in precision instruments because of the shortage of foreign-made sapphire bearings, are made in various sizes no bigger than the head of a pin. They are claimed to be superior to sapphire in many respects.

Science News Letter, May 6, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 206.

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